BACKGROUND

● Retrospective ascertainment of cancer therapy journeys from real-world data is challenging. Often, characterizations of the treatment journey from individual treatment data rely on algorithmically determined sequences of regimens. Those sequences of regimens, or lines of therapy (LoTs), consist of antineoplastic drugs that are administered concurrently or in close proximity.5

● While algorithms for determining LoTs in solid tumor care may share some common characteristics, they also must account for relevant, tumor-specific factors, such as tumor maintenance therapy (MTx).6

● LoT algorithms have been extensively used in lung cancer, breast cancer, and other solid tumors, but to our knowledge, only one algorithm for epithelial ovarian cancer (EOC) has been published, and was based on a relatively small sample of patients.7

● Using real-world data, we developed an EOC-specific LoT algorithm that accounts for MTx and more rapid disease progression later in the disease course, and evaluated its performance.

METHODS

Patient Population

The study population included adult female patients diagnosed with EOC (defined as invasive ovarian, fallopian tube, or primary peritoneal cancer and excluding germ cell tumors, sex cord-stromal tumors, sarcomas, and other rare non-epithelial tumors) between 01/01/2015 and 09/30/2022, and who had evidence of treatment with systemic therapy within the Syapse Learning Health Network (LHN), a database of patients with cancer receiving care in US community health systems.

Syapse Certified Tumor Registrars (CTRs) manually curated information for all relevant patient demographic and clinical characteristics, as well as all antineoplastic therapies administered during the study period. Curated treatment-related data included therapy start and end dates.

All patients were followed from their EOC diagnosis date (index) through death, date of last curation by CTRs, or end of study (12/31/2022).

Invasive ovarian, fallopian tube, or primary peritoneal cancer and excluding germ cell tumors, sex cord-stromal tumors, sarcomas, and other rare non-epithelial tumors

Inclusion criteria:

● Any therapies initiated after a treatment gap of 120 days (for first or second line) were assigned to the index date.
● Any therapies initiated within 30 days from the date of the first therapy administration following the index date were assigned to the first line treatment regimen. Drops and additions did not initiate a new line as long as at least one drug in the initial regimen (determined within the first 30 days) continued.
● Each subsequent LoT was classified as either a treatment (Tx) or MTx line depending on the therapies in (1) the present LoT and (2) the LoT immediately preceding it.

New treatment lines:

● Any therapies initiated after a treatment gap of 120 days (for first or second line) or 90 days (for third or later lines) constituted a new Tx line.

New maintenance lines:

● Bevacizumab was considered MTx if it overlapped with the prior Tx LoT or was first administered within 90 days of the preceding Tx LoT end date.
● Poly (ADP-ribose) polymerase inhibitors (PARPis) were considered MTx if:
  ○ It overlapped with the prior LoT, or
  ○ It was initiated within 90 days of the end date of first or second Tx lines, or
  ○ It was initiated within 90 days of the end date of third or later Tx lines.
● Bevacizumab and PARPi combination therapy was considered MTx if each met the maintenance treatment-specific criteria outlined above.

Switch therapies:

● The algorithm allowed for switches within lines between platinum-based therapies, taxanes, PARPis, and bevacizumab. MTx lines additionally allowed switches from bevacizumab to PARPi.

● Unexpected regimens were flagged and validated by manual review.

LoT validation through expert review.

The performance of the algorithm was evaluated in the subset of patients with advanced stage, non-mucinous EOC who received 1L platinum-based chemotherapy (n = 1,355).

Patient records were independently reviewed by a medical oncologist and therapies received in the follow-up period were assigned to a LoT.

● The concordance between the algorithmically-determined and expert-determined receipt of 1L MTx was reported.

RESULTS

Patient Characteristics. There were 2,275 eligible EOC patients. After excluding 415 patients with missing, incomplete, or invalid therapy, there were 1,860 patients in the current study (Table 1).

● Median age at diagnosis was 65 years (interquartile range [IQR], 56-73) and median follow-up time was 23 months (IQR, 13-41).

● Patients were predominantly white (83%), diagnosed with serous EOC (61%), advanced stage (stage III: 45%, stage IV: 29%), and high grade (71%).

● In a sensitivity analysis comparing patients who were excluded from analysis to those in the current study, patients were similar with respect to age at diagnosis, race, and tumor grade, but excluded patients were more likely to be diagnosed with endometrioid EOC and earlier stage disease (data not shown).

Line of Therapy Output. Nearly half (48%) of the patients only received 1L Tx; 15% of patients received 3 or more LoTs (Table 2).

● Overall, 15% received 1L MTx without any subsequent treatment.

● The majority of patients received platinum and taxane (73%) or platinum and taxane plus bevacizumab (16%) as 1L Tx.

● Among the 440 patients who received 1L MTx, the top regimen was PARPi monotherapy (56%) followed by bevacizumab monotherapy (35%).

LoT Validation. Among the subset of patients evaluated (74%), concordance between expert review and the algorithm for the receipt of 1L MTx was 98% (data not shown).

Sample Patient Journeys. Examples of patient journeys and corresponding assignment of lines and regimens are depicted in Figure 1.

CONCLUSIONS

● The EOC-specific line of therapy algorithm performed well: there was high concordance with expert clinical review in distinguishing receipt of maintenance therapy.

● The proposed algorithm is one of the few available for EOC. By enabling the accurate assignment of lines of therapy, this work can facilitate meaningful investigations of the real-world utilization and effectiveness of EOC treatments.

REFERENCE

5. SEER*Rx Interactive Antineoplastic Drugs Database: https://seer.cancer.gov/tools/seerrx/